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METHOD FOR SENSORY EVALUATION OF MILK POWDER

UDC 637·143 : 543·92

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MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
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~~Price Rs 5~~ Gr 2

February 1982

Indian Standard

METHOD FOR SENSORY EVALUATION OF MILK POWDER

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Indian Standard

METHOD FOR SENSORY EVALUATION OF MILK POWDER

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 31 December 1981, after the draft finalized by the Sensory Evaluation Sectional Committee had been approved by the Agricultural and Food Products Division Council.

0.2 Evaluation of milk powder, whole or skimmed, on the basis of its sensory characteristics plays an important role in its marketing. Those who buy milk powder give prime consideration to its sensory properties, such as flavour and appearance for its acceptability. The sensory examination of milk powder assumes great significance in this country in particular, as the procurement of skimmed milk powder has been taken up in a big way from outside as well as within the country where it is manufactured at feeder-balancing plants in the flush season for its subsequent reconstitution during the lean period so as to maintain the milk supply to the needy areas. This standard prescribes the method and conditions for the sensory evaluation of milk powder for assessing the quality of market product and for quality control by the manufacturer.

0.3 This standard is complementary to IS : 1165-1975*.

0.4 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960†. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard prescribes conditions, technique, method and evaluation card for sensory evaluation of milk powder.

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*Specification for milk powder (*second revision*).

†Rules for rounding off numerical values (*revised*).

2. TERMINOLOGY

2.1 For the purpose of this standard, the following definitions in addition to those given in IS : 5126 (Part I)-1969* and IS : 5126 (Part II)-1969† shall apply.

2.1.1 *Acid* — Flavour defect resulting from the growth of lactic acid bacteria in the fluid milk.

2.1.2 *Caked* — A defect in which powder forms hardened masses which break into hard chunks having little dispersibility in water.

2.1.3 *Churned Particles* — Masses of coalesced fat and/or coagulated protein in the reconstituted milk which tend to float and adhere to the sides of the containers.

2.1.4 *Feed* — An off-aroma characteristic, such as weedy and sulphurous, caused by certain feeds consumed by the milch animal.

2.1.5 *Foreign* — Any objectionable flavour, chemical or medicinal, not ordinarily associated with good quality milk.

2.1.6 *Grainy* — Visible insoluble particles of granular nature in the reconstituted product.

2.1.7 *Lumpy* — Non-homogeneous appearance due to lumps of agglomerated powder particles, in powder/reconstituted form.

2.1.8 *Neutralizer* — An alkaline flavour typical of alkali used to standardize the acidity of milk.

2.1.9 *Oxidized* — A flavour defect caused by fat oxidation perceived as cardboardy, oily or tallowy.

2.1.10 *Soiled* — Unsightly exterior defect on package due to the presence of the product or foreign matter.

2.1.11 *Unclean* — An unpleasant odour and taste suggestive of organic decomposition associated with persistent after-taste.

2.1.12 *Unsealed* — Improperly secured closure that makes contamination of the product possible without breaking or tearing a visible seal.

3. GENERAL CONDITIONS

3.1 The general conditions for sensory evaluation of milk powder shall be as given in IS : 6273 (Part I)-1971‡.

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*Glossary of general terms for sensory evaluation of foods : Part I Methodology.

†Glossary of general terms for sensory evaluation of foods : Part II Quality characteristics.

‡Guide for sensory evaluation of foods : Part I Optimum requirements.

4. PANELISTS

4.1 Selection of Panelists — Persons with normal sensitivity for basic tastes and odours should be chosen to form the judging panel. They should also be trained to identify and estimate the desirable quality attributes as well as defects in the product.

4.2 Training

4.2.1 *Preparation of Milk Powder Samples for Training* — A control sample of freshly prepared milk powder representing all the desirable sensory characteristics should be served along with defects prepared as follows:

a) *Acid* — Reconstitute fresh milk powder (as indicated under **5.2**) and inoculate lactic starter at the rate of one percent and incubate at 28 to 30°C for 2, 6 and 10 hours to obtain different degrees of acidity.

b) *Astringent* — Add one percent solution of alum at the rate of 0·5, 2·0 and 4·0 percent to the reconstituted milk to attain varying degrees of astringency.

c) *Feed* — Expose, in a close chamber, the reconstituted milk to freshly cut onion/turnip/lucern for 1, 3 and 6 hours so as to develop feed flavour in varying concentrations in the product.

d) *Metallic* — Add 0·5 percent solution of ferrous sulphate (prepared in distilled water) to the reconstituted milk at the rate of 1, 3 and 5 percent so as to simulate different degrees of metallic flavour in the product.

e) *Neutralizer* — Develop different levels of lactic acid in the reconstituted milk, as in (a) above, and neutralize the acid to about 0·12 percent with a dilute neutralizer solution. Both lime and soda can be used as neutralizers.

f) *Oxidized* — For manipulating this defect, blow air/oxygen through different lots of reconstituted milk for 30, 60 and 120 minutes.

g) *Rancid* — Homogenize raw whole milk at 40 to 45°C and allow it to stand for about one hour at 37°C before heating it to 75°C. Mix the homogenized milk with reconstituted milk at the rate of 10, 20 and 50 percent to obtain different degrees of rancidity.

h) *Salty* — Add sodium chloride to reconstituted milk at the rate of 0·1, 0·15 and 0·2 percent so as to develop salty taste in the product.

4.2.2 *Procedure for Training* — The panelists should be familiarized with all characteristics of fresh milk powder prepared under ideal conditions. They should also be trained to detect and discriminate against likely defects in the product with respect to its flavour and appearance.

4.2.2.1 A series of 20 judgements should be obtained from each prospective panelist for each defect with known differences at levels perceived as definite. To compensate for the known day to day variations, qualifying test should be given for a 3-day period. Those who make an acceptable score (75 percent correct) should be selected.

4.3 The panelists shall be checked once every three months for their acuity and consistency.

4.4 Number of Panelists — A minimum of five persons should be employed. A minimum of judgements may be taken using the panel.

5. SAMPLING, PREPARATION AND PRESENTATION

5.1 Sampling — A representative sample should be drawn from the lot to be examined (*see* 1165-1975*). Precautions should be exercised to avoid any extraneous contamination while drawing, handling and presenting the samples.

5.2 Preparation of Samples — The sample in its original container should be placed on a table for its visual examination. The product from the container should be served to the panelists in petri-plates with lids. Secondly recostitute the dry milk by adding 10 g of it, in case of non-fat dry milk or 13 g, in case of dry whole milk, to 100-ml of distilled water at 45°C, followed by vigorous agitation with the use of an electric mixer for 90 seconds. Take out the milk in tasting glasses or beakers covered with petri-plates and allow it to stand for 30 minutes before serving to the panelists.

5.3 Amount of Sample — Fifty millilitres of the reconstituted milk should be taken.

5.4 Number of Samples — The number of samples in one session should not exceed 5. When the number of samples is more, repeat sessions with 3 to 4 hour intervals.

5.5 Coding — Coding of the samples should be done as recommended under **7.7** of IS : 6273 (Part I)-1971†.

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*Specification for milk powder (*second revision*).

†Guide for sensory evaluation of foods : Part I Optimum requirements.

6. PROCEDURE FOR EVALUATION

6.1 Technique of Evaluation — Examine the product in relation to the designated category, such as milk, skimmed milk, spray dried milk powder, etc. The product package is examined for surface soiling and proper seal. The sample served in petri-plates should first be examined for its odour in the head space by just opening the lid and sniffing, then for appearance and finally by placing a small amount in the mouth. Similarly the reconstituted sample should initially be tested for odour and appearance followed by flavour examination. The flavour noticed in the dry product should be related with that found in the reconstituted product before giving the final score for defectives.

6.2 Method — Follow the composite scoring method as given in **4.2.8** of IS : 6273 (Part II)-1971*.

6.3 Evaluation Card — Use the evaluation card given in Table 1 for recording observations. Indicate the sample score in the column provided for it after deducting the total defective score for each attribute.

6.4 Grading — After computation of data recorded in Table 1 by panelists the following grades should be awarded:

Score	*Grade*
90 and above	Excellent
80 — 89	Good
60 — 79	Fair
59 and below	Poor

6.5 Statistical Evaluation of Results

6.5.1 For the purpose of statistical evaluation one of the methods mentioned under **4.2.8.4** of IS : 6273 (Part II)-1971* should be adopted.

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*Guide for sensory evaluation of foods: Part II Methods and evaluation cards.

TABLE 1 EVALUATION CARD FOR MILK POWDER

(*Clauses* 6.3 and 6.4)

Name.. Date...

Code No. .... Time..

A) Score the sample for different characteristics. Indicate the degree of defects, if any, encircling the applicable one and deduct accordingly from the attribute score.

CHARACTERISTIC	MAXIMUM SCORE	MINIMUM FOR EACH ATTRIBUTE SCORE	SAMPLE SCORE
(1)	(2)	(3)	(4)
i) Package appearance	5	3	
ii) Appearance of dry product	15	9	
iii) Appearance of reconstituted milk	15	9	
iv) Body and texture of reconstituted milk	20	60	
v) Flavour of reconstituted milk	45	60	

NOTE — If the sample scores less than the minimum for any characteristic, it is to be rejected.

B) Degree of defects

CHARACTERISTIC	DEFECT	DEGREE OF DEFECT		
		Suspicion	Definite	Pronounced
(1)	(2)	(3)	(4)	(5)
i) Appearance of package	Soiled surface/unsealed	1	2	3
ii) Appearance of dry product	Caked/brown particles extraneous matter	2	5	10
iii) Appearance of reconstituted milk	Lumpy brown	1	2	5
	Churned/brown particles grainy/undispersed lumps	2	5	10
iv) Flavour	Oxidized/stale/rancid	2	3	10
	Chalky/acid/ neutralizer/ salty	2	5	10
	Metallic/cooked/scorched	1	2	5
	Weedy/bitter/foreign	5	10	15